

White-tailed Deer Population Status 2005

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Abstract

The statewide posthunt white-tailed deer population estimate for 2005 was 1,088,700. This was 54% above the statewide goal of 709,300. With a harvest of over 184,000 adult bucks but only 283,000 antlerless deer, the posthunt 2005 population was 4% higher than a year ago. The 2005 posthunt population was more than 20% above goal in 93 deer management units. The statewide 2005 posthunt population was the fifth highest on record.

Methods

Population estimates for most deer management units in the state were calculated using the Sex-Age-Kill (SAK) formula. This formula combines information on the age composition of the buck harvest with an estimate of the percentage of adult buck mortality that is due to legal hunting (buck recovery rate) to estimate the percentage of the adult buck population that is harvested (buck harvest rate). The size of the prehunt adult buck population in each management unit is estimated by dividing the unit's registered buck harvest by the estimate of the buck harvest rate. The prehunt adult buck population estimate is then expanded to estimate the entire prehunt deer population by 1) multiplying the buck population estimate by the adult sex-ratio to estimate the size of the adult doe population, and 2) multiplying the doe population estimate by the fall fawn:doe ratio to estimate the fall fawn population. The posthunt deer population is estimated by subtracting the total harvest from the prehunt estimate.

Primary inputs to the SAK formula are 1) year- and unit-specific harvests of antlered and antlerless deer, 2) the average percentage of yearlings among harvested bucks, 3) the average percentage of yearlings among harvested does, 4) the buck recovery rate, and 5) fall fawn:doe ratios. The percentage of yearlings among harvested bucks is used as an estimate of the annual mortality rate of adult bucks. Multi-year averages are used for yearling buck and doe percents because annual variation in reproduction or fawn survival can affect annual estimates of the percentage of yearlings, thereby biasing estimates of adult buck mortality. In addition, year- and unit-specific samples of aged deer are often inadequate for reliable estimation of yearling percents.

Average yearling buck and doe percents and buck recovery rates were updated in 2005 for most deer management units in the state. Fawn:doe ratios were updated in the Northern and Central forest regions based on the results of the Summer Deer Observation survey.

Sales of gun deer licenses in 2005 were 1% lower than in 2004. The opening weekend of the November 2005 firearm season had snow cover and mild temperatures throughout much of the state. In some parts of the north, wet snow inhibited hunter visibility and movements. Thanksgivings Day was cold with high winds. Rain and freezing drizzle on the final Sunday likely reduced hunter pressure. Approximately 90% of corn crop had been harvested by opening weekend, near the 5 year average. Because of the widespread snow cover the Deer Committee rated hunting conditions as above average. The Deer Committee believed it was appropriate to make a partial upward adjustment to estimates of buck recovery rates in most Northern Region units.

Twenty-six deer management units had earn-a-buck regulations in effect during the 2004 deer season (Table 1). Hunters were required to harvest an antlerless deer before they were allowed to harvest a buck. Buck harvest rates were reduced in 2004 and the SAK formula was not used to estimate population size in these units. Population size in these units was estimated using accounting-style population models. Model inputs were calibrated to produce the best fit between simulated trends and historic SAK estimates.

Population estimates for units in the CWD management zones also were not based on the SAK method because buck harvest rates were likely below average due to earn-a-buck regulations, as well as, possible public concerns related to hunting in areas potentially affected by CWD. Population estimates were based on helicopter quadrat surveys in the Southwest and Southeast Disease Eradication Zones (DEZs) and fixed-wing transect surveys in units in the Herd Reduction Zone. Deer per mile indices from the fixed-wing transect surveys were converted to estimates of density based on a regression model developed in the SW DEZ that related fixed-wing counts to helicopter survey estimates. In addition, accounting population models were used for 13 of 17 Herd Reduction Zone units where a series of previous SAK estimates was available to calibrate the accounting models.

Results

The statewide overwinter population goal of 709,300 in 2005 was 2% higher than in 2004 due to changes in unit density goals and boundaries. Estimates of size of posthunt deer populations during 2005 were made for 120 deer management units (Table 1). Statewide, the 2005 posthunt population estimate was 1,088,700, which was 54 above the posthunt population goal. The estimated statewide population was 4 higher than in 2004. The statewide 2004 posthunt population was fifth highest on record. Unit-specific posthunt population densities ranged from 10-67 deer/mi² of deer range and averaged 32 deer/mi².

In 2005, 3 units had population estimates that were more than 20% below goal. Eight units had populations that were 1-20% below goal. Fifteen units had populations that were between goal and 20% above goal. Population estimates in 33 units were 21-50% above goal and 60 units had populations that are more than 50% above goal. Population estimates declined 20% or more from 2004 in 13 units and increased 20% or more in 32 units.

Deer populations in the Northern Forest, Eastern Farmland, and Western Farmland regions increased substantially during the 1980's (Figure 1). Aggressive harvests during the late 1980's and early 1990's, combined with very poor recruitment in the Northern and Central Forest regions in 1992, reduced populations to near goal in the North and below goal in the Central Forest. Deer populations in all regions grew rapidly following the conservative harvests in 1993 reaching a record statewide posthunt population in excess of 1,120,000 in 1995. Liberal harvests in the farmland regions together with over-winter losses associated with the severe winters of 1995-96 and 1996-97 reduced populations from the 1995 peak in all regions. The near-record mild winter of 1997-98 and relatively conservative antlerless harvests in 1998 allowed population growth in all regions. Substantial antlerless harvests across much of the state in 2000, together with the moderately severe winter of 2000-01 in the Northern Forest, set the stage for population declines in all regions in 2001. The lower harvests in 2002 led to population increased in all regions in 2003. Aggressive antlerless harvests and below average recruitment in 2004 contributed to population declines in most regions. Lower antlerless harvests in 2005 resulted in population increases in most regions.

The posthunt population in the Northern Forest region increased 8% from 2004 to 2005 and was 23% above goal in 2005. The Central Forest population increased 24% between 2004 and 2005 and was 33% above goal in 2005. The Eastern Farmland population decreased 5% but remained 56% above goal. Populations in the Western Farmland increased 5% and populations in the Southern Farmland increased 3%. The Western and Southern Farmland populations were 58% and 137% over goal, respectively.

Table 1. *White-tailed deer population status in Wisconsin deer management units, 2004-2005.*

Region & Unit	Population goal		2004 posthunt population			2005 posthunt population			% change
	Num.	Den. ^a	Num.	Den. ^a	% over goal	Num.	Den. ^a	% over goal	from 2004
Northern Forest									
01	3,220	20	3,500	22	9	4,900	31	53	41
01M	320	10	430	14	35	710	22	120	63
02 ^b	11,286	18	15,600	31	70	17,700	28	57	-8
03 ^{bc}	8,880	16	14,200	26	113	14,400	26	62	2
04 ^b	5,235	15	5,000	14	43	7,100	20	36	43
05 ^{cd}	4,520	20	5,400	24	19				
06 ^{bc}	6,552	12	8,500	19	62	10,600	19	61	-1
07	2,835	15	2,300	12	-18	1,800	10	-36	-21
08	7,400	20	6,100	17	-17	8,100	22	10	32
09	8,760	20	12,300	28	41	15,300	35	75	24
10	8,625	25	8,100	24	-6	10,600	31	23	30
11	6,820	20	7,600	22	12	7,600	22	12	0
12	4,488	17	5,200	20	17	6,600	25	47	26
13 ^e	10,725	15	14,500	20	35	16,100	23	50	11
14 ^e	4,592	14	8,200	25	78	8,700	26	89	6
17	3,570	15	4,800	20	35	6,300	26	76	30
18	7,360	20	9,400	26	28	12,000	33	63	27
19 ^e	8,060	20	9,600	24	20	10,000	25	24	4
20 ^e	6,804	18	9,100	24	34	9,300	25	37	2
24	5,560	20	9,000	32	61	9,600	35	73	7
25	8,740	20	12,100	28	38	14,300	33	63	18
26	7,820	20	10,300	26	32	10,700	27	36	4
28 ^b	9,840	15	11,900	18	66	11,200	17	14	-6
29A ^b	3,585	15	4,600	19	62	4,300	18	21	-7
29B	2,796	12	2,100	9	-24	2,900	13	5	38
30	4,725	15	6,000	19	27	6,800	22	44	14
31	8,280	20	8,300	20	0	8,500	21	3	3
32	10,227	21	9,300	19	-9	11,000	23	7	18
34	4,454	17	4,700	18	6	5,200	20	16	10
35 ^b	7,080	20	10,400	25	27	8,900	25	25	-1
36	6,850	25	8,900	32	29	10,800	39	58	22
37	5,875	25	5,100	22	-13	5,900	25	1	16
38 ^b	8,580	20	8,100	21	5	9,100	21	6	1
39 ^b	8,500	20	5,500	13	-33	5,300	12	-38	-8
40	6,560	20	4,800	15	-27	5,700	17	-13	19
41	4,875	25	4,800	25	-2	5,400	28	10	12
42	6,540	20	6,500	20	0	5,900	18	-10	-10
43	6,120	15	6,200	15	1	7,100	18	17	15
44	7,922	17	7,000	15	-12	7,300	16	-7	5
45	11,860	20	9,300	16	-21	10,600	18	-10	14
49A	5,875	25	7,500	32	27	4,300	18	-27	-43
49B	4,550	25	5,700	32	26	3,900	21	-14	-32
50	6,680	20	4,600	14	-31	5,800	17	-14	25
52	6,080	20	7,300	24	20	7,300	24	20	0
78 ^e	330	15	870	40	165	510	23	55	-41
Regional									
total	290,356		330,700		18	356,120		23	8

Table 1. Cont.

Region & Unit	Population goal		2004 posthunt population			2005 posthunt population			% change from 2004
	Num.	Den.	Num.	Den.	% over goal	Num.	Den.	% goal	
Central Forest									
53	11,525	25	10,900	24	-6	16,200	35	41	49
54A	12,100	25	13,300	27	10	16,800	35	39	27
55	15,775	25	17,300	27	10	20,000	32	27	15
56	10,050	30	10,100	30	1	11,500	34	14	13
58	12,650	25	15,000	30	19	17,800	35	41	18
Regional									
total	62,100		66,600		7	82,300		33	24
Eastern Farmland									
27	4,960	20	7,200	29	46	6,900	28	40	-4
33	5,520	20	6,200	22	11	7,900	28	42	28
46	8,025	25	13,700	43	71	13,200	41	64	-4
47 ^c	6,725	25	9,900	37	48	8,600	32	28	-14
51A ^c	5,500	25	10,000	45	81	8,200	37	48	-18
51B ^c	9,725	25	16,300	42	67	14,000	36	44	-14
57	3,212	22	4,700	32	48	4,500	31	40	-5
57A	5,950	25	7,300	31	22	8,500	36	43	17
57B	6,300	25	8,200	32	30	8,100	32	28	-1
57C	7,980	30	9,300	35	17	10,300	39	29	10
62A	10,050	25	16,600	41	65	18,000	45	79	8
62B ^c	9,075	25	15,700	43	73	16,400	45	80	4
63A ^c	8,475	25	16,500	49	94	13,900	41	64	-15
63B ^c	6,300	25	9,700	38	54	9,200	37	46	-5
64	4,860	20	9,800	40	101	8,200	34	70	-16
64M	810	10	4,500	56	461	2,900	36	263	-35
65A	5,160	30	8,700	51	69	5,000	29	-2	-42
65B ^c	10,410	30	14,900	43	43	15,600	45	50	5
66 ^c	4,300	25	10,700	62	148	9,800	57	127	-8
80A ^c	2,280	15	5,000	33	120	4,000	26	76	-20
80B ^c	3,880	20	7,700	40	98	8,300	43	115	8
81 ^c	270	15	900	51	243	1,000	54	259	5
Regional									
total	129,767		213,500		65	202,500		56	-5
Western Farmland									
15 ^b	9,108	22	10,200	25	-1	14,700	36	62	44
16	8,375	25	11,400	34	37	13,000	39	55	14
21	5,625	25	6,000	27	7	7,400	33	31	22
22	6,980	20	8,100	23	16	10,400	30	49	28
22A	7,060	20	9,900	28	40	9,400	27	34	-4
23	8,060	20	13,500	33	67	15,200	38	89	13
59A	10,400	20	10,900	21	4	13,500	26	30	24
59B	10,305	15	17,000	25	65	18,500	27	80	9
59C	15,650	25	32,400	52	107	32,300	52	107	0
59D ^c	7,680	20	12,000	31	56	10,100	26	31	-16
59M	440	10	1,800	41	307	2,000	45	355	12

Table 1. Cont.

Region & Unit	Population goal		2004 posthunt population			2005 posthunt population			% change from 2004
	Num.	Den.	Num.	Den.	% over goal	Num.	Den.	% over goal	
60A	3,400	20	4,600	27	35	3,600	21	5	-22
60B	1,660	20	2,000	24	20	2,800	34	69	41
60M	800	10	1,700	21	113	1,700	21	109	-2
61 ^{bc}	19,160	20	31,700	33	120	26,900	28	40	-15
Regional total	114,703		173,200		56	181,500		58	5
Southern Farmland									
54B	4,650	25	9,200	49	97	8,400	45	82	-8
54BCWD ^e	2,090	10	4,800	23	130	5,900	28	188	22
54C ^c	2,375	25	3,400	35	41	3,100	33	31	-7
67A ^c	8,850	25	22,600	64	155	21,200	60	139	-6
67B ^c	4,700	25	12,100	65	158	10,900	58	133	-10
68A ^c	3,900	30	7,000	54	80	6,700	51	71	-5
68B	5,490	30	8,200	45	50	6,400	35	17	-22
69	9,775	25	12,200	31	25	8,800	23	-10	-28
70CWD ^e	2,000	10	7,200	35	250	4,400	22	120	-37
SW-DEZ ^f	<3,720	<5	21,700	28	454	25,300	34	580	23
70BCWD ^e	1,940	10	4,900	25	150	6,600	34	240	36
70ECWD ^e	690	10	3,000	44	341	2,800	41	310	-7
70GCWD ^e	1,220	10	5,700	47	370	7,300	60	500	28
71CWD ^e	6,260	10	14,100	25	150	22,500	36	260	44
72 ^c	10,080	20	16,000	32	58	13,700	27	36	-14
73B	3,700	20	5,200	28	41	5,800	31	57	11
73BCWD ^e	540	10	1,600	30	200	1,700	32	220	7
73D	3,160	20	3,900	25	23	5,300	34	69	37
73ECWD ^e	1,720	10	3,400	22	120	4,800	28	180	27
74A ^b	4,000	20	7,600	38	155	7,800	39	96	2
74B	8,640	20	10,200	24	18	15,300	35	77	50
75ACWD ^e	1,460	10	7,200	40	300	6,700	46	361	15
75CCWD ^e	240	10	1,000	43	329	1,400	59	492	37
75DCWD ^e	1,000	10	5,200	46	360	6,700	67	570	46
76CWD ^e	1,400	10	5,300	41	310	8,600	61	511	49
76A ^g	4,825	25	10,300	53	114				
76ACWD ^e	3050	10	6,400	57	470	15,200	50	400	-12
76MCWD ^e	510	10	1,500	29	190	1,600	31	210	7
77ACWD ^e	1,020	10	5,500	54	440	5,900	58	478	7
SE-DEZ ^h	<460	<5	2,700	50	902	1,400	15	193	-70
77BCWD ^e	2,010	10	5,700	25	150	7,000	35	250	40
77C	2,025	15	5,500	41	174	5,100	38	152	-8
77CCWD ^e	1,740	10	12,500	67	570	6,400	37	270	-45
77M	3,120	10	6,200	20	100	5,600	18	78	-11
Regional total	112,360		259,000		131	266,300		137	3
Total	709,286		1,043,000		47	1,088,720		54	4

Table 1. *Cont.*

^a Deer/mi² of deer range.

^b Unit population goal changed in 2005 due to change in density goal or unit boundary.

^c Unit had earn-a-buck regulations in 2004. Population estimate based on accounting model.

^d Unit 5 was eliminated in 2005 and dissolved into Units 2 and 6.

^e Population goal and 2005 estimate apply to that portion of unit in the 2005 CWD Herd Reduction Zone. Population estimate in 2004 may apply to a different area due to changes in Herd Reduction Zone boundary.

^f SW Disease Eradication Zone includes all of Unit 70A and parts of 7 surrounding deer management units. Population estimate in 2004 applies to a different area due to changes in Disease Eradication Zone boundary.

^g Combined in 2005 with the portion of the unit in the CWD Herd Reduction Zone.

^h SE Disease Eradication Zone includes parts of units 77A, 77B, and 77C.

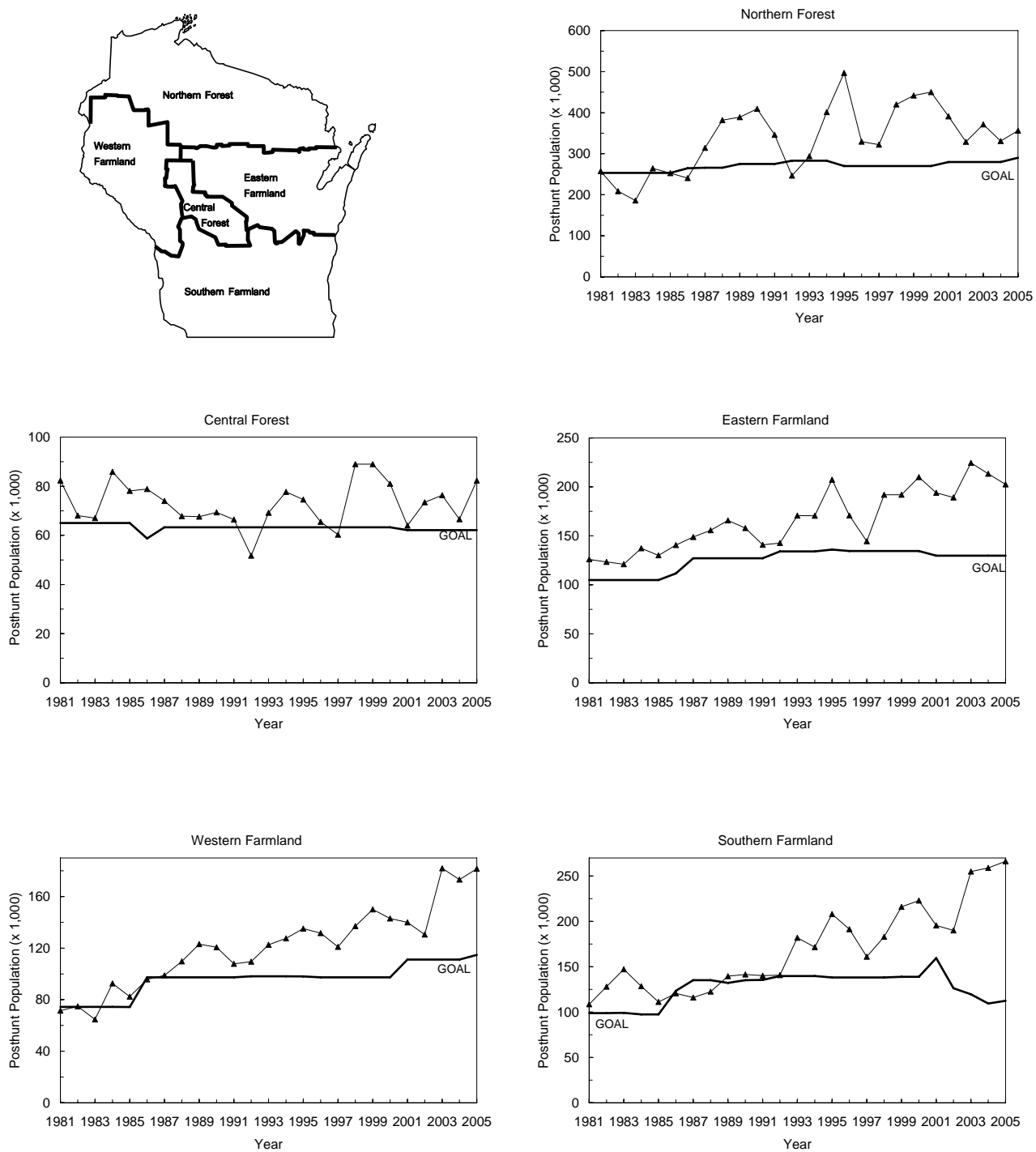


Figure 1. Regional white-tailed deer population trends in Wisconsin, 1981-2005.